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be attached to the side sprays and run into the centre stem. If the frond is strong enough to allow of the wires occasionally looping in and out of it, the wires will keep their positions easily; but if too fragile for this, they must be bound here and there by some extra reel wire. When the operation is finished the fern frond can be bent into a graceful downward curve, and placed in an upright position in the bouquet.

PRINTING BUTTERFLIES' WINGS.

II.

WHEN the page of impressions, printed as described last month, is thoroughly dry, and before the wings are cut out, is the time to remedy any defects or deficiencies which may be apparent. As a rule, any injury to the scales (feathers some choose to call them) or to the edges of the wings will have been observed before the impression has been taken. But it is wise for the printer to cultivate a habit of careful examination before separating the wings from the body of the insect. The minute differences which appear in varieties of the same class will thus be observed, and the chances will be lessened of a natural spot or mark (which may perhaps be the distinguishing mark of the variety) being mistaken for a defect in the print, and vice versa. Were the entire surface of the membrane invariably covered by scales, this doubt would perhaps seldom be raised; but this is by no means the case.

Another habit to which the collector will do well to accustom himself is that of never printing *both* the anterior and *both* the posterior wings on the same paper. Of course in the case of common specimens, where there is no question as to duplicates, this custom need not be followed. But even then, as persons in general are slaves to habit, we would advise it, in order that it may come as the natural method of procedure when rare and unique specimens are being printed. The best plan is to print one anterior and one posterior wing, and then to compare the impression with the remaining natural wings, paint in from the latter any faults or defects which are observable, and thus make sure of one perfect side, by which the second print may in like manner be rectified, should it also appear in any way defective.

A touch of ordinary water-color, used with a little ox-gall, is all that is necessary, and this, with fairly good specimens, is very seldom required, excepting when, as sometimes happens, the scales having been rubbed off the bony ridges, the latter appear in the impression white instead of colored, as they will be seen in nature when the print is compared with the real wings.

We have said that the membrane is not invariably covered; and there are many butterflies and moths in which this absence of scales from portions of the membrane occurs. In the case of these the uncovered membrane often gives the color and brilliancy, the scales being in general pure black or very dark brown. The most brilliant illuminating colors often fail to convey an adequate idea of the natural hue, and look dull and pale when placed in juxtaposition with the real wings. The best course to pursue in this case is carefully and delicately to cut out the colored portions of the membrane after the print has been taken and is dry, and to gum each one very exactly into its own place, which will be found a blank on the print.

There is yet another difficulty with regard to colored membranes to be noticed. It will be found that some butterflies derive their color solely from the membrane which shows through and affects the white or yellowish scales. If such butterflies as these are printed upon white paper, the impression will not convey a correct idea of the color of the original. The print should therefore be made upon paper the color of the membrane. To insure this being exact, one wing should be printed off, and the paper matched against the bare membrane which is left. The white or yellowish scales printed off upon well-matched paper produce the exact effect required.

In conclusion it remains to cut out the wings, and to mount them upon the paper on which the body is to be painted. The cutting out must be done with extreme neatness, and the bodies and antennæ should be painted in with great care and accuracy. Upon this depends much of the value of the collection from a naturalist's point of view, for in many cases the shape and color of the antennæ determine the class or family to which the specimen belongs.

A collector naturally endeavors to procure specimens as perfect as possible; and the best means of insuring this is to get either the caterpillars or the cocoons, and, suspending them in a cage made of a light framework of wood walled with muslin, watch for the birth of the butterfly or moth. Its rapid development is interesting and wonderful to observe, but when fully attained the specimen should be killed at once, in order to preserve the bloom on the wings in perfect beauty.

The quickest and therefore the most merciful method of killing the larger specimens is by poison. Cyanide of potassium is the most efficacious; but so deadly is this poison that there is great risk of disaster should it fall into the hands of ignorant persons or of children. It is well, therefore, if this poison is to be used, to procure one of the jars now made for naturalists, in which the poison is placed at the bottom, and over the poison a layer of plaster of Paris is run, which, being porous, admits of the fumes passing through and acting upon the insect, while at the same time it confines the poison itself to one place. For those who have not one of these jars, but who wish to use the cyanide, the best plan is to procure a wide-mouthed jar, fitted with a patent air-tight stopper, and to lay over the poison at the bottom of the jar several folds of blotting-paper. These will to some extent answer the same purpose as the plaster of Paris—that is, they will permit the fumes to pass through, and will at the same time absorb part of the moisture, which would otherwise damp and spoil the wings were they brought into actual contact with the cyanide.

COLLECTING FERNS.

THE winter season during the prevalence of mild weather is unquestionably the most suitable time for removing ferns. The next best time is the early spring, just as the new fronds are about to commence their growth. But those who are not experienced collectors might at such seasons often find a difficulty in recognizing some species, because of the fact that the parts which afford the most easy means of recognition—the fronds—are dead. The evergreen species mostly retain their fronds all the winter, and would, therefore, be easy to find. But it is not so, of course, with the deciduous species, which include the most fragile of the herbaceous kinds.

Ferns, however, are so hardy, that not only in winter and early spring, but throughout spring, summer, and autumn, they can be uprooted and transplanted with but little injury, beyond perhaps the disfigurement of one or two of the growing fronds. Even this minimum of injury may be avoided by very careful handling, and, should it be inflicted, the plant will not be long in supplying the place of its lost fronds.

We may look upon fern collecting, therefore, as a delightful pursuit, which can be followed all the year round. But it must be remembered that success in removing ferns from their habitats during the summer, especially during the prevalence of hot weather, will more depend upon the method which is adopted and upon the care which is exercised during the operation than will be the case during the winter or early spring.

Where a fern-collecting tour is decided on, the collector should be provided with a small garden fork, a stout chisel, a hammer, a strong clasped knife, a trowel, and a covered basket or other receptacle for carrying the ferns. Should it be determined to hunt for very large specimens, it would be necessary to add a spade to the implements named. But in such a case special means of conveyance would need to be provided from some point, as near as possible to the locality from which the ferns are to be taken; and indeed such conveyance would be desirable whenever fern-hunting on a large scale is to be indulged in. In an ordinary way, however, it will be found that the implements needed for removing from their habitats the smaller and rarer ferns can be conveniently carried in a small tourist's bag, slung on the back of the pedestrian collector; and in the same convenient way it will be found possible by careful packing to carry a good number of plants. Whenever possible, it is desirable to take up the specimens with sufficient earth to prevent a disturbance of the roots. But in any case it is necessary that every possible portion of root should be taken up, even to the ultimate fibrous rootlets. This object can be secured by carefully digging at a safe distance round and underneath the rootstock of the plant. Nothing so

much promotes the rapid recovery of a plant after removal as the exercise of great care in getting up the entire mass of roots and rootlets. It must be remembered that it has often taken the rootstock a long time to develop its network of rootlets, which as they grew have penetrated into all the surrounding interstices of the soil or rock from which the plant derives its sustenance. If, therefore, the work of months is ruthlessly undone in a moment by the thoughtless tearing up of the plant without its mass of root-feeders, it cannot be expected that the same vigor will be immediately shown under cultivation as was before exhibited. Yet many fern collectors on getting out of the earth or rock by a sharp pull of the hand what looks to them like an entire root, are surprised and disappointed on finding that the earliest fronds thrown up under cultivation have sadly dwindled from their natural size. Even when to all appearance there is a sufficient mass of rootlets secured, it often happens that a considerable number are left unperceived in the earth.

It is especially in the removal of the rock-loving ferns that the greatest violence is usually done to the plants. Most of the rock-growing species have very abundant, wiry, fibrous rootlets, which penetrate in a very remarkable way the stony interstices in the neighborhood of the rootstock. It is often made a subject of complaint by fern collectors, that the rock-growing species are more difficult than any others to establish under cultivation. But the difficulty arises chiefly from the circumstance which has already been alluded to. No doubt it is often a matter of difficulty to uproot the rock-loving ferns, and it is for this work that hammer and chisel are necessary, so that by the careful undermining and removal of the adjacent portions of rock, the crown, rootstock, and rootlets of the specimen desired may be got out unharmed. A little practice, however, if it be joined to a careful and loving study of the plant's peculiarities, will soon give the mastery in this kind of work.

When, by the careful process recommended, ferns are got out from their places of growth, damp moss or other moist material should be wrapped securely round their rootstocks and rootlets. In this way they can be conveniently carried to a considerable distance without any covering to the fronds, although if the air be very hot, dry, and sultry, the fronds, if intended to remain on the plant, must—especially those of the most fragile or herbaceous kinds—be kept under shelter, as they would be if put into a covered basket or other convenient covered receptacle. In removing the larger kinds of ferns, however, during the summer, it may often be found convenient—especially where room for putting the specimens has to be economized—to cut off all, or at least the largest of the fronds, and to wrap in moss, or keep covered merely the rootstocks and rootlets. When planted in the garden or other place of cultivation, new fronds, as we have already said, will, if under favorable conditions, speedily be thrown up to supply the place of those removed. Where a tour is made in search of small specimens of ferns, it is best, after wrapping moss—which is generally to be found in the neighborhood of ferns—around each little root, to pack together—root side by side with root—the whole of the specimens. If a moist wrapper be then placed round them, they will keep fresh for days and even for weeks if occasionally looked at and sprinkled with water. In collecting the rock-loving species of ferns, it is desirable when possible to detach a little portion of the rock, so as to avoid tearing off the rootlets of the plant.

Now that natural flowers are available for the centre of dining-room tables, mention must be made of an excellent method for preserving the variegated shrubs and artificial flowers which have decorated the jardinières or china vases, open corbeilles, and shallow flower receptacles. Instead of filling the latter with sand or mould for the purpose of imbedding the wire stalks therein, a false lid of cardboard is cut exactly fitting the inside of the vase; in this holes are perforated, and when the stalks are put through they are cut on the under side, leaving about an inch over, which is then bent and glued back to the cardboard. When all the flowers and foliage have been thus mounted, moss is gummed on the upper side of the cardboard to hide the interstices, and the moss should be of different colors. In this manner, however elaborate a floral arrangement, it all remains in place, and only requires to be lifted from the vase like a cover. A gauze is thrown over, and it is put aside in a cupboard until wanted.